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16
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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/602,253	06/23/2003	Salman Akram	2269-3091.5US (96-0890.04)	1942
24247	7590	09/22/2004	EXAMINER ANDUJAR, LEONARDO	
TRASK BRITT P.O. BOX 2550 SALT LAKE CITY, UT 84110			ART UNIT 2826	PAPER NUMBER

DATE MAILED: 09/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/602,253	Applicant(s) AKRAM, SALMAN	
	Examiner Leonardo Andújar	Art Unit 2826	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 June 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 5 and 12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 and 6-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Acknowledgment

1. The amendment filed on 06/21/2004 has been entered. The present Office action is made with all the suggested amendments being fully considered. Accordingly, pending in this Office action are claims 1-12.

Election/Restrictions

2. Applicant's election without traverse of species 1 in a communication filed on 02/23/2004 is acknowledged. New claim 12 has been withdrawn from further consideration since it is directed to a non-elected species 4.

Priority

3. An application in which the benefits of an earlier application are desired must contain a specific reference to the prior application(s) in the first sentence of the specification of in an application data sheet (37 CFR 1.78(a)(2) and (a)(5)). The specific reference to any prior nonprovisional application must include the relationship (i.e., continuation, divisional, or continuation-in-part) between the applications except when the reference is to a prior application of a CPA assigned the same application number.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Art Unit: 2826

5. Claims 1-4 and 6-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duboz et al. (US 5,726,500) in view of Schaefer et al. (US 6,075,290) further in view of Elenius et al. (US 6,441,487).

6. Regarding claim 1, Duboz (e.g. fig. 5) shows most aspects of the instant invention including a semiconductor substrate 51; a passivation layer (not labeled) and a metal connection 58 formed in the passivation layer which has been sized and configured to temporarily receive a substantially spherical interconnection element 67 attached to a semiconductor device 30. Duboz, also, shows an external electrode 36 overlapping the electrodes 69.

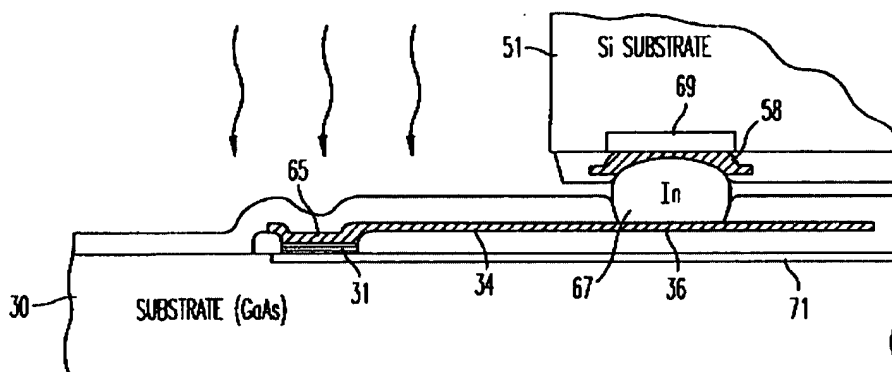
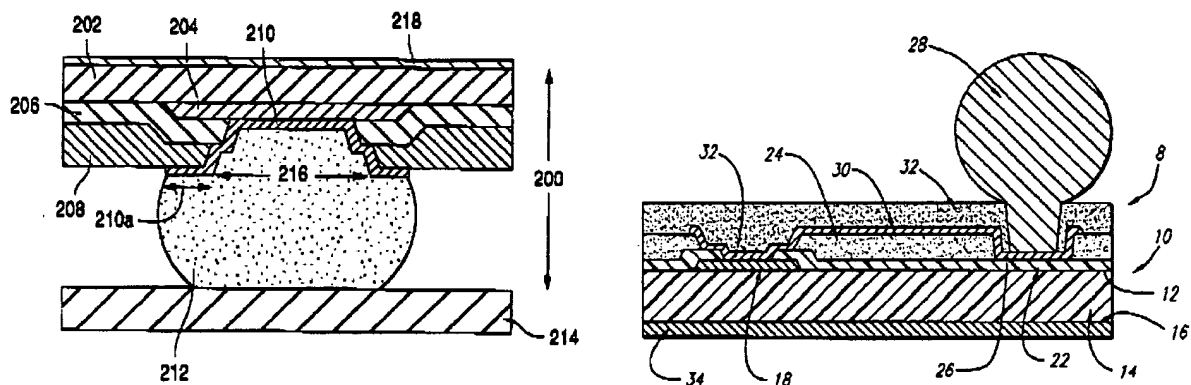


FIG. 5

7. Duboz does not show that the metal connection is a metal lined via formed in the passivation layer or a conductive trace overlapping a dielectric layer. Nevertheless, Schaefer shows a metal lined via 210 in a passivation layer 206/208 whereas Elenius (e.g. fig. 2) shows a conductive trace 30 on a dielectric layer 22 and a passivation layer 24 over the conductive trace. The metal lined vias according to Schafer's invention

Art Unit: 2826

prevent stress related problems such as crate formations within the die (see Schaefer's fig. 2, col. 2/lls. 32-67; col. 3/lls. 1-11 & col. 5/lls. 41-44). Selenium's embodiment provides an improved chip scale package that has a small form factor, i.e. the resulting chip scale package is not larger than the size of the original integrated circuit (col. 3/lls. 16-41). Furthermore, Elenius discloses that the size and the amount of the solder bumps are compromised due to the fact that the solder pads are typically located at the perimeter of the integrated circuit. The solder bump contact pads can be redistributed internally, away from the outer perimeter of the integrated circuit; the size of such solder bumps is unchanged. Therefore, the requirements of complex integrated circuits can be fulfilled (col. 2/lls. 25-40).



It would have been obvious to one of ordinary skill in the art at the time the invention was made to make Duboz's metal connection in form of metal lined via to prevent stress related problems such as crate formations within the die as taught by Schafer and to provide the a conductive trace over a dielectric layer in Duboz in view of Schafer's invention in order to improved the chip scale package by providing a small

Art Unit: 2826

form factor, i.e. the resulting chip scale package is not larger than the size of the original integrated circuit, and to internally redistribute the solder bump contact pads, away from the outer perimeter of the integrated circuit to fulfill the requirements of complex integrated circuit as taught by as taught by Elenius.

8. Regarding claims 2 and 3, Duboz in view of Schaefer further in view of Elenius teaches that the metal lined via is formed of a size and shape to receive approximately less than the 50% of an overall height of a substantially spherical interconnection element 212 (see Schaefer's fig. 2). Duboz in view of Schaefer further in view of Elenius does not explicitly disclose specific values such as 30% or between 10 and 50 % of the overall height of the interconnection element 212. Nevertheless, a change in size is generally recognized as being within the level of ordinary skill in the art. In re Rose, 105 USPQ 237 (CCPA 1955).

It would have been an obvious matter of design choice to make the lined via having a size of approximately 30% or between 10 and 50% of the overall height of the interconnection element 212, since such a modification would have involved a mere change in the size of a component as taught by In re Rose, 105 USPQ 237 (CCPA 1955).

9. Regarding claim 4, Schaefer shows that the via includes sloped sidewalls.

10. Regarding claim 6, Elenius shows that the conductive traces includes copper (col. 7/lls. 1-28).

11. Regarding claim 7, Elenius shows that the passivation layer comprises polyimide (col. 6/ll. 45).

Art Unit: 2826

12. Regarding claim 8, Schaefer in view of Elenius discloses the claimed invention except for metal lined via comprising a material from the group of gold, platinum, and tungsten.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to metal lined via disclosed by Shafer in view of Elenius comprising a material from the group of gold, platinum, and tungsten, since it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416.

13. Regarding claim 9, Elenius does not explicitly teach that the dielectric layer 22 is made of silicon oxide. However, Elenius teaches that the dielectric layer 22 is a passivation layer whereas Schaefer teaches that passivation may comprise insulating materials such as silicon oxide (col. 5/lls. 61-63). Furthermore, it has been held to be within the general skill of a worker in the art to select a known material on the basis of its suitability for the intended use as a matter of obvious design choice. *In re Leshin*, 125 USPQ 416

It would have been obvious to one having ordinary skill in the art at the time the invention was made to make the insulating layer disclosed by Duboz in view of Schafer further in view of Elenius of silicon oxide because Schaefer teaches that insulating layers such as passivation layers can be made of silicon oxide and because it has been held to be within the general skill of a worker in the art to select a known material (i.e.

Art Unit: 2826

silicon oxide) on the basis of its suitability for the intended use (i.e. passivation layer) as a matter of obvious design choice as taught *In re Leshin*, 125 USPQ 416.

14. Regarding claims 10 and 11, Duboz in view of Schaefer further in view of Elenius shows most aspects of the instant invention except for a passivation layer having a thickness of about 20-25 or about 100 microns. However, the specification contains no disclosure of either the critical nature of the claimed arrangement or any unexpected results arising therefrom. Where patentability is said to be based upon particular chosen dimensions or upon another variable recited in a claim, the applicant must show that the chosen dimensions are critical. *In re Woodruff*, 919 F.2d 1575, 1578, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990). Additionally, a change in size is generally recognized as being within the level of ordinary skill in the art. *In re Rose*, 105 USPQ 237 (CCPA 1955).

It would have been an obvious matter of design choice to make the passivation layer having a thickness of about 20-25 or 100 micros since such a modification would have involved a mere change in the size of a component as taught by *In re Rose*, 105 USPQ 237 (CCPA 1955).

Response to Arguments

15. Applicant's arguments with respect to claims 1-4 and 6-11 have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

16. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Leonardo Andújar whose telephone number is 571-272-1912. The examiner can normally be reached on Mon through Thu from 9:00 AM to 7:30 PM EST.

18. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nathan J Flynn can be reached on 571-272-1915. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

19. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Application/Control Number: 10/602,253

Page 9

Art Unit: 2826

Leonardo Andújar

Patent Examiner

Art Unit 2826

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